

## Claims

- [c1] 1. A gas dynamic pressure bearing comprising:
- a shaft,
  - a sleeve whose inner peripheral surface is opposed to an outer peripheral surface of the shaft through a micro-gap, and
  - a substantially cylindrical hub which applies a surface pressure to an outer side of the sleeve and which is fitted to the sleeve, in which
  - a dynamic pressure generating groove is formed on at least one of the outer peripheral surface of the shaft and the inner peripheral surface of the sleeve, wherein if linear expansion coefficients of the shaft, the sleeve and the hub are defined as  $\alpha_0$ ,  $\alpha_1$  and  $\alpha_2$ , respectively, a relation of  $\alpha_1 < \alpha_0 < \alpha_2$  is satisfied.
- [c2] 2. The gas dynamic pressure bearing as set forth in claim 1, wherein
- if a fastening width between the sleeve and the hub at 20°C is defined as  $\delta$ , and a fitting diameter between the sleeve and the hub is defined as  $2R_2$  and a difference between the maximum using temperature and 20°C is defined as  $\Delta T$ , the following relation expression (1) is

satisfied, and

if a thickness of the sleeve is defined as  $t_1$  and a thickness of the hub is defined as  $t_2$ , the following relation expression (2) is satisfied:

$$2R_2 \Delta T(\alpha_2 - \alpha_1) \leq \delta \dots (1)$$

$$\frac{t_2}{t_1} \geq 0.25 \dots (2).$$

- [c3] 3. A motor having a gas dynamic pressure bearing, comprises:
- a shaft,
- a sleeve whose inner peripheral surface is opposed to an outer peripheral surface of the shaft through a micro-gap, and
- a substantially cylindrical hub which applies a surface pressure to an outer side of the sleeve and which is fitted to the sleeve, in which
- a dynamic pressure generating groove is formed on at least one of the outer peripheral surface of the shaft and the inner peripheral surface of the sleeve , wherein
- if linear expansion coefficients of the shaft, the sleeve and the hub are defined as  $\alpha_0$ ,  $\alpha_1$  and  $\alpha_2$ , respectively, a relation of  $\alpha_1 < \alpha_0 < \alpha_2$  is satisfied, and
- the motor further comprises a bracket for fixing the shaft, a stator mounted on the bracket, and a magnet mounted on the hub such as to be opposed to the stator.

- [c4] 4. The motor as set forth in claim 3, wherein in the gas dynamic pressure bearing, if a fastening width between the sleeve and the hub at 20°C is defined as  $\delta$ , and a fitting diameter between the sleeve and the hub is defined as  $2R_2$  and a difference between the maximum using temperature and 20°C is defined as  $\Delta T$ , the following relation expression (1) is satisfied, and if a thickness of the sleeve is defined as  $t_1$  and a thickness of the hub is defined as  $t_2$ , the following relation expression (2) is satisfied:
- $$2R_2 \Delta T (\alpha_2 - \alpha_1) \leq \delta \dots (1)$$
- $$t_2/t_1 \geq 0.25 \dots (2).$$

- [c5] 5. A disk apparatus on which a disk-like storage medium capable of storing information is mounted, the disk apparatus comprising; a housing, a motor for spinning the recording disk and fixed inside said housing, and a data access means for reading/writing data on the recording disks, wherein the motor comprises a shaft, a sleeve opposed whose inner peripheral surface is opposed to an outer peripheral surface of the shaft through a micro-gap, and a substantially cylindrical hub which is fitted when a surface

pressure is applied to an outer side of the sleeve, the motor further comprises a gas dynamic pressure bearing in which a dynamic pressure generating groove is formed on at least one of the outer peripheral surface of the shaft and the inner peripheral surface of the sleeve , if linear expansion coefficients of the shaft, the sleeve and the hub are defined as  $\alpha_0$ ,  $\alpha_1$  and  $\alpha_2$ , respectively, a relation of  $\alpha_1 < \alpha_0 < \alpha_2$  is satisfied, the motor further comprises a bracket for fixing the shaft, a stator mounted on the bracket, and a magnet mounted on the hub such as to be opposed to the stator.

- [c6] 6. A hard disk drive as set forth in claim 5, wherein in the gas dynamic pressure bearing, if a fastening width between the sleeve and the hub is defined as  $\delta$ , and a fitting diameter between the sleeve and the hub is defined as  $2R_2$  and a difference between the maximum using temperature and 20°C is defined as T, the following relation expression (1) is satisfied, and if a thickness of the sleeve is defined as  $t_1$  and a thickness of the hub is defined as  $t_2$ , the following relation expression (2) is satisfied:

$$2R_2 \Delta T(\alpha_2 - \alpha_1) \leq \delta \dots (1)$$

$$t_2/t_1 \geq 0.25 \dots (2).$$